FOOD WEB LAB

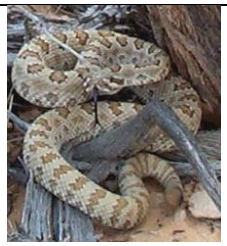
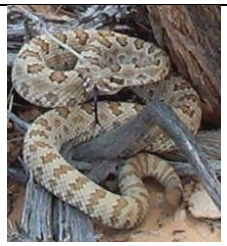
In this lab, we will be imitating a small food chain in which sunflowers represent the lowest tropic level (the producers), mice represent the primary consumers, snakes represent the secondary consumers, and cougars represent tertiary consumers. The raccoon is thrown in as an omnivore that can feed at multiple trophic levels.

You will draw a slip from a hat to determine which organism you are on the food chain. You will then be assigned a certain quantity of energy points. If you get eaten you will give up points to what ate you. If you eat, you will receive points from that prey item. If you encounter something you can not eat, you will lose points from the energy required to fight with or deal with that organism. At the beginning of each round, sunflowers will acquire 1 energy unit each from photosynthesis.

Once you know which organism you are, **DO NOT** tell anyone. Simply walk around until I say **FEED!** If you are an animal, at that moment, approach someone near you and say **"I am a *BLANK*, can I eat you?"** If they reveal that they are a prey item, take the appropriate number of energy points from them. If they reveal themselves to be one of your predators, you will give them the points because you were eaten. If you are sunflower, don't say anything, just let them approach you.

Animals	**Total Energy Start**	**Total Energy Round 1**	**Total Energy Round 2**	**Total Energy Round 3**	**Total Energy Round 4**
Cougar (1)	44 - 44				
Raccoon (1)	30 - 30				
Snake (3)	24 - 72				
Mouse (5)	16 - 80				
Sunflower (10)	12 -120				
+ Energy gained by photosynthesis					
∑ Energy (16)	**346**				
minus Energy lost to heat					

At the end of the round, write down on the back of your slip what happened and how many energy points you gained or lost. We will run four rounds and then see how the energy units end up. At the end of the lab, you will subtract 8 points (3 points for sunflowers) as heat lost to the environment and we will see how much energy is left over.

 **Cougar**	 **Raccoon**	 **Snake**	 **Snake**	 **Snake**
You can not be eaten	You can be eaten by a Cougar, but not a snake.	You have 24 energy points.	You have 24 energy points.	You have 24 energy points.
You start with 44 energy points	You have 30 energy points	You can be eaten by a cougar, but not a raccoon.	You can be eaten by a cougar, but not a raccoon.	You can be eaten by a cougar, but not a raccoon.
If you eat a Raccoon you **gain** 10 energy points.	If you are eaten by a Cougar you **lose** 10 energy points.	If you are eaten by a Cougar you **lose** 10 energy points.	If you are eaten by a Cougar you **lose** 10 energy points.	If you are eaten by a Cougar you **lose** 10 energy points.
If you eat a snake you **gain** 8 energy points.	If you eat mice you **gain** 4 energy points.	If you eat mice, you **gain** 4 energy points.	If you eat mice, you **gain** 4 energy points.	If you eat mice, you **gain** 4 energy points.
If you eat mice, you **gain** 4 energy points.	If you eat a sunflower you **gain** 2 energy points.	If you encounter a raccoon you **lose** 5 energy points in the fight.	If you encounter a raccoon you **lose** 5 energy points in the fight.	If you encounter a raccoon you **lose** 5 energy points in the fight.
If you try to eat sunflower, you **lose** 8 energy points.	If you encounter a snake, you **lose** 5 energy points in the fight.	If you try to eat a sunflower, you **lose** 2 energy points.	If you try to eat a sunflower, you **lose** 2 energy points.	If you try to eat a sunflower, you **lose** 2 energy points.
		If you encounter another snake, you lose 1 point.	If you encounter another snake, you lose 1 point..	If you encounter another snake, you lose 1 point..

 **Mouse**	 **Mouse**	 **Mouse**	 **Mouse**	 **Mouse**
You have 16 energy points	You have 16 energy points	You have 16 energy points	You have 16 energy points	You have 16 energy points
You can be eaten by Cougars, snakes, and raccoons.	You can be eaten by Cougars, snakes, and raccoons.	You can be eaten by Cougars, snakes, and raccoons.	You can be eaten by Cougars, snakes, and raccoons.	You can be eaten by Cougars, snakes, and raccoons.
If you are eaten you **lose** 4 energy points.	If you are eaten you **lose** 4 energy points.	If you are eaten you **lose** 4 energy points.	If you are eaten you **lose** 4 energy points.	If you are eaten you **lose** 4 energy points.
If you eat a sunflower you **gain** 2 energy points.	If you eat a sunflower you **gain** 2 energy points.	If you eat a sunflower you **gain** 2 energy points.	If you eat a sunflower you **gain** 2 energy points.	If you eat a sunflower you **gain** 2 energy points.

If you encounter another mouse you lose 1 point..	If you encounter another mouse you lose 1 point..	If you encounter another mouse you lose 1 point..	If you encounter another mouse you lose 1 point..	If you encounter another mouse you lose 1 point..

Cut out each strip and place into a basket for students to select

 **Sunflower**	 **Sunflower**	 **Sunflower**	 **Sunflower**	 **Sunflower**
You have 10 energy points	You have 10 energy points	You have 10 energy points	You have 10 energy points	You have 10 energy points
You can be eaten by mice and raccoons	You can be eaten by mice and raccoons	You can be eaten by mice and raccoons	You can be eaten by mice and raccoons	You can be eaten by mice and raccoons
If you are eaten you lose 2 energy points.	If you are eaten you lose 2 energy points.	If you are eaten you lose 2 energy points.	If you are eaten you lose 2 energy points.	If you are eaten you lose 2 energy points.
Every round you gain 1 energy point from the sun through photosynthesis.	Every round you gain 1 energy point from the sun through photosynthesis.	Every round you gain 1 energy point from the sun through photosynthesis.	Every round you gain 1 energy point from the sun through photosynthesis.	Every round you gain 1 energy point from the sun through photosynthesis.

 **Sunflower**	 **Sunflower**	 **Sunflower**	 **Sunflower**	 **Sunflower**
You have 10 energy points	You have 10 energy points	You have 10 energy points	You have 10 energy points	You have 10 energy points
You can be eaten by mice and raccoons	You can be eaten by mice and raccoons	You can be eaten by mice and raccoons	You can be eaten by mice and raccoons	You can be eaten by mice and raccoons
If you are eaten you lose 2 energy points.	If you are eaten you lose 2 energy points.	If you are eaten you lose 2 energy points.	If you are eaten you lose 2 energy points.	If you are eaten you lose 2 energy points.
Every round you gain 1 energy point from the sun through photosynthesis.	Every round you gain 1 energy point from the sun through photosynthesis.	Every round you gain 1 energy point from the sun through photosynthesis.	Every round you gain 1 energy point from the sun through photosynthesis.	Every round you gain 1 energy point from the sun through photosynthesis.

Thought Questions

1) Which organisms had an overall increase in energy points?

2) Which organisms had the most decrease in total energy points?

3) Why did we have more sunflowers than mice and more mice than snakes?

4) Do you think this was a realistic exercise in how a food chain operates? Why or why not?

5) If you could adjust this game to make it more realistic, how would you change it?

6) Would you change the number of organisms in each category or add any more categories?

7) Would you change the number of energy points each starts with or how many they get for feeding? What else could help?

8) If you wanted to add decomposers to this game, what would you need to do?